

**REMARKS**

Claims 1-5, 13-16, and 18-27 are all the claims presently pending in the application. It is again pointed out that claim 27 corresponds to claim 12 previously indicated by the Examiner as being allowable if rewritten in independent format.

It is noted that Applicants specifically state that no amendment to any claim herein, if any, should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 1-5, 13-16, 18-25, and 27 stand rejected under 35 U.S.C. § 112, second paragraph, for allegedly being indefinite.

Claims 1-5, 19, 21, 23, and 25 stand rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,632,379 to Mitomo et al. Claims 1 and 3-5 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent Publication 2003/0052595 A1 to Ellens et al, further in view of JP 04021570 to Asayama et al.

Claim 2 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Ellens/Asayama, further in view of U.S. Patent No. 5,998,925 to Shimizu et al. Claims 14-16 and 18 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,717,353 to Mueller et al. Claims 19, 21, and 25 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Ellens/Asayama, further in view of U.S. Patent Publication 2004/0109302 to Yoneda.

Claims 20, 22, and 26 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Mueller, further in view of Yoneda, or, in the alternative, over Ellens, further in view of Yoneda. Claim 23 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Ellens/Asayama/Yoneda, further in view of Shimizu. Claim 24 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Mueller, further in view of Yoneda.

It is noted that there is no prior art rejection currently of record for either claim 13 or 27, so that both these claims are deemed allowable once indefiniteness issues are resolved.

The above-recited rejections are respectfully traversed in the following discussion.

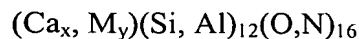
**I. THE CLAIMED INVENTION**

As described and defined in, for example claim 1, the claimed invention is directed to a light emitting apparatus, including a light emitting element with an emission wavelength in a range of 360 to 550 nm, a rare-earth element doped oxide nitride phosphor. The light emitting

element comprises a reflection layer.

A part of light radiated from the light emitting element is wavelength-converted by the phosphor, and the phosphor comprises a sialon system phosphor powder including:

$\alpha$ -sialon of 40 weight% or more and 90 weight% or less of the sialon system phosphor powder, the  $\alpha$ -sialon being structured such that a Ca site of Ca-  $\alpha$ -sialon represented by



is partially replaced by metal (M);

$\beta$ -sialon of 40 weight% or less of the sialon system phosphor powder; and

unreacted silicon nitride of 30 weight% or less of the sialon system phosphor powder, where M comprises metal that is one or more selected from Ce, Pr, Eu, Tb, Yb and Er and  $0.05 < (x + y) < 0.3$ ,  $0.02 < x < 0.27$  and  $0.03 < y < 0.3$ .

As discussed beginning at line 19 of page 1 and more particularly beginning at line 15 on page 4, the present inventors have recognized that conventional methods of mixing LED lights to obtain colors have problems with specific colors such as red or white.

The claimed invention, on the other hand, as explained at lines 1-6 of page 5, provides a combination of elements that improve these problems specifically for red and white, including, in one exemplary embodiment, an adjustment of emission efficiency by incorporating a reflection layer in the light emitting element.

## II. THE 35 USC §112, SECOND PARAGRAPH REJECTIONS

Claims 1-5, 13-16, 18-25, and 27 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite.

Relative to the rejection for claims 1-5, 13, 19, 21, 23, 25, and 27, this rejection is directed to the "weight%" and is believed to be addressed appropriately in the above claim amendments. Support for this change is found in paragraphs [0341], [0345], [2348], and [0351] of US 2005/0001225A1, the publication of this application, which corresponds respectively to the paragraphs at the following location of the hard copy as filed: lines 19-27 of page 60, lines 14-21 of page 61, line 28 of page 61 through line 7 of page 62, and lines 12-19 of page 62.

Relative to the rejections for claims 14-16, 18, 20, 22, and 24, this rejection is directed to the terminology “a doping amount x.” Applicants submit that “x” is defined as being “a doping amount” and that this claim construction inherently defines the parameter named “x” and that the claims defines a range of values. Therefore, Applicants submit that there is nothing indefinite about this claim language. However, in an effort to expedite prosecution, these claims have been amended for further clarification, as supported by the description in paragraph [0159] of US 2005/0001225A1, corresponding to line 29 of page 26 through line 5 of page 27.

In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

### **III. THE PRIOR ART REJECTIONS**

The Examiner alleges that Mitomo teaches the claimed invention defined by claims 1-5, 19, 21, 23, and 25.

The Examiner also alleges that Ellens, when modified by Asayama, renders obvious claims 1 and 3-5, when further modified by Shimizu, renders obvious claim 2, when further modified by Yoneda, renders obvious claims 19, 21, and 25, and, when modified by Yoneda, renders obvious claims 20, 22, and 26.

The Examiner also alleges that Mueller renders obvious claims 14-16 and 18, and, when modified by Yoneda, renders obvious claims 20, 22, and 26.

Applicants submit that there elements of the claimed invention which are neither taught nor suggested in these prior art references.

Specifically, in an exemplary embodiment, the present invention includes a reflection layer, as described in paragraph [0112] of US 2005/0001225A1, the publication of this application (which corresponds to the paragraph beginning at line 7 on page 16.

Due to this reflection layer, the emission efficiency is enhanced and, as the emission efficiency increases, the brightness of the light emitting apparatus accordingly increases. Especially, as described in [0354] of US 2005/0001225A1 (corresponding to lines 23-28 on page 62 of the hard copy filing), in mixed  $\alpha$ -sialon phosphors, the position of the excitation spectrum shifts to the longer wavelength side compared to conventional oxide phosphors (less

than 400 nm, e.g., see [0024] of US 2005/0001225A1, corresponding to lines 19-27 of page 4 of the filed hard copy), and its absorption peak overlaps with emission wavelengths (450-550 nm) of the blue LED. This effect allows the light emitting apparatus including a blue LED to increase its brightness more effectively, since the emission efficiency increases due to this reflection layer.

None of the cited references teaches or suggests this reflection layer, so that the light emitting apparatus of these references cannot have the same effects as the claimed invention.

Hence, turning to the clear language of the claims, in neither Mitomo, Ellens, nor Yoneda is there a teaching or suggestion of: "...the light emitting element comprising a reflection layer ...", as required by independent claim 1. Independent claims 14 and 20 have similar language, so that claims 1-5, 13-16, and 18-26 are clearly patentable over Mitomo and Ellens.

Moreover, relative to the pulsing current defined in claims 19-26, there is no suggestion to provide a pulsing current relative to either primary references, Mitomo and Ellens. The Examiner relies upon Yoneda, as discussed in the rejection for claim 19, for this feature. However, the technique in secondary reference Yoneda is based upon pulsing different LEDs, thereby mixing the output lights, not the pulsing of the light emitting element so as to mix with the converted light emissions within the device. Thus, Yoneda fails to satisfy the plain meaning of the claim language, even if the primary references were to be modified. Applicants submit that the mixing of light within a light emitting apparatus by relative pulses to a phosphor is non-obvious over mixing of light from two different light emitting devices.

Claim 27 was previously indicated as allowable.

Therefore, Applicants submit that claims 1-5, 13-16, and 18-27, all of the claims currently pending, are allowable over the prior art currently of record, and the Examiner is respectfully requested to withdraw this rejection.

#### **IV. FORMAL MATTERS AND CONCLUSION**

The Examiner objects to the specification for the description at lines 21-27 of page 22, because parameters "m" and "n" are not defined and neither parameter occurs in the formula.

In response, Applicants direct the Examiner's attention to the fact that this discussion on page 22 for this formula actually continues the discussion of the generic formula in line 25 of page 20, where "m" and "n" are expressly identified. Thus, the discussion on page 22 is a specific example of this generic formula on page 20 and the reference to "m" and "n" on page 22 is merely recognition of the specific values for these two parameters.

Therefore, with the foregoing explanation, Applicants believe that the discussion on page 22 is indeed clear, and the Examiner is respectfully requested to reconsider and withdraw this objection.

In view of the foregoing, Applicant submits that claims 1-5, 13-16, and 18-27, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance.

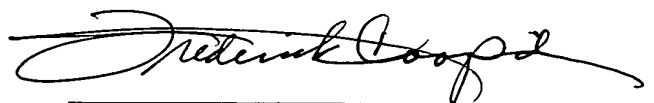
The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Date: 11/6/06

Respectfully Submitted,



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